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The 1918 Influenza Epidemic in Nashville

JOHN B. THOMSON, M.D.

Introduction

There has been a resurgence of interest in influenza this year, because whereas last year we had a vaccine without an epidemic, if the "Russian flu" moves in, this year we may have an epidemic with no vaccine. To have a major antigenic shift in the influenza virus in two consecutive years is rare, and the likelihood that neither would produce an epidemic is slim indeed.

During the push for the swine flu vaccine in the winter of 1976-77 the severity of the 1918 influenza epidemic was repeatedly emphasized. In spite of this, when I was doing research on the history of medicine in Nashville, I found little mention of the influenza epidemic, though there was considerable comment on enteric diseases such as cholera, and it appeared the cholera epidemic of 1873 was the worst epidemic Nashville ever had.

My sources of information were quite limited, as there are no health reports for Nashville and Davidson County between 1912 and 1943. Various reasons are given for this, the most convincing being that there were insufficient funds to publish the reports, and the manuscript versions were lost in the various moves of the health department. The 1912 cut-off is probably the result of the abolition of the board of health in that year, when the legislature initiated the City Commission System for Nashville. Fortunately, there is mention of the epidemic in the *Journal of the Tennessee Medical Association*, most importantly an epidemiologic study by Capt. R. C. Derivaux, an assistant surgeon in the U.S. Public Health Service assigned to the public health relief mission in Nashville during the epidemic,

and Dr. W. E. Hibbett, Nashville's health officer.¹

The first intimation that the epidemic, which extended from mid-September to late October, 1918, might not have been as bad as the "old-timers" paint it was that it made the *Nashville Banner's* front page only once, although there was a little more front page reporting of it in the *Tennessean*. Accounts of the flu epidemic nationwide suggest that when peace finally came from the war which had occupied everyone for the past four years, the world was so busy with the flu epidemic that peace came almost unnoticed. This certainly was not true in Nashville, where the epidemic had ended and where even during the epidemic almost all the news on the front page and a good percentage of it elsewhere concerned the war effort. Judging from newspaper reporting, the influenza epidemic was of less than disastrous proportions in Nashville.

Was the epidemic bad or not so bad? Were the newspapers and the health officers playing it straight, or were they underplaying its severity for wartime propaganda purposes, to boost morale, and prevent panic?

History

Influenza, also known historically as la grippe (grip), catarrhal fever, or "cat" fever in the Navy, is an acute infectious respiratory disease of man caused by one of the three distinct immunologic types of the influenza virus. The disease usually occurs in epidemics, often worldwide, showing high morbidity and low mortality. Though the clinical symptoms vary from one epidemic to another, and also from strain to strain, in general there is sudden onset of fever, usually with severe aching, pharyngitis, cough, and often leukopenia. The disease is usually self-limiting in three or four days.

¹From the Department of Pathology, Vanderbilt University Medical Center, Nashville, TN 37232.

All evidence suggests the disease is an ancient one, with explosive epidemics in populations over the world, and we have good descriptions of it as early as Hippocrates. Between 1510 and 1930 pandemics are recorded in which the symptoms are given almost precisely as they occur today, with a comment that few died of the disease except the old and the infirm. The pandemic of 1743 was exceptionally severe, and the death toll in London was as great as it was in American cities in the pandemic of 1918. It was in the 1743 epidemic that the disease was given the name *influenza*, from an Italian phrase which attributed the disease to *un influenza di freddo*, "an influence of cold," although the term "influence" was usually applied to stellar or planetary influence and only occasionally to such things as meteorologic conditions, miasms, or emanations from the earth—or cold.

In 1782 a severe pandemic involved Asia and Europe. The number of complications is said to have been very high, and during this epidemic the thesis of its infectious nature gained ground. Another hundred years were to elapse however before anywhere near accurate epidemiologic data were compiled and bacteriologic studies undertaken to determine the causative agent.

In 1892 Pfeiffer described the *Hemophilus influenzae*, which he thought caused the disease. In 1889 Abbot demonstrated spread to be independent of the direction of the prevailing wind. Everything seemed to be building to a climax. It occurred in the winter of 1918-19 with a pandemic of 200 million cases, in which about 20 million people died, a half million of them in the United States.

The 1918 Pandemic

The pandemic of 1918 differed from any previously reported in that the mortality rate of hospitalized cases (mostly pneumonia) was unusually high, varying from 15% to 30%, with the highest mortality in the 25 to 30 year age group. Over half the dead were younger than 50, and relatively few of them were old and infirm. Although it is certainly true that many of these patients died of streptococcal or pneumococcal pneumonia, many also died within the first 72 hours, making it almost certain that death was due to the influenza virus itself. It should be remembered that although at that time *H. influenzae* was considered to be the etiologic agent, the organism

was cultured from only three of the first eight autopsies reported from Cook County Hospital, and Pfeiffer himself, the discoverer of the organism, working in Breslau, Germany, was encountering a similar discrepancy, casting doubt on the etiologic significance of the agent. More puzzling still was the fact that many lung cultures were returning sterile.

Because of the multiplicity of organisms being isolated in series of cases the world over, there was no common ground for agreement as to the causative agent, although the Pfeiffer bacillus (*H. influenzae*) which was in many places most prevalent, probably had the greatest number of adherents. During the epidemic Dr. Ernest Goodpasture, who would become, in 1925, head of the Department of Pathology of the reorganized Vanderbilt Medical School, was stationed as a medical officer at the U.S. Naval Hospital in Chelsea, Mass., where the estimated mortality was between 25% and 30%. Reporting a series of autopsied cases,² he postulated an underlying cause which left the lung incapable of protecting itself against superimposed bacterial pneumonia.

Following his discharge from the service some months later, Dr. Goodpasture, then a member of the Department of Pathology of Harvard Medical School, reported two autopsied cases of influenza pneumonia,³ one of which terminated fatally seven days after the onset of illness but only two days following evidence of pulmonary involvement. The other patient survived his infection but died a month later of sterile hemorrhagic pneumonia with associated glomerular nephritis, the first reported case of Goodpasture's syndrome. These two cases, a part of the previously reported series from the Chelsea Naval Hospital, had sterile pulmonary cultures in the face of extensive lung damage.

The purpose of this second paper was to call attention to the lesion he had described previously, a lesion also described by MacCallum and Wolbach, which was a hyaline membrane partially or completely covering the walls of dilated alveolar ducts. Although it was present in cases with bacterial pneumonia, it occurred mostly in areas of the lung where there was little or no inflammatory exudate, and he considered it to be pathognomonic of nonbacterial damage to the lungs from whatever cause. He concluded that "in the absence of any known infectious agents one is led to the conclusion that they represent instances of fatal influenzal pneumonia, caused by an infectious agent of which we are totally ignorant, and

without secondary invasion of the lungs by any of the pathogenic bacteria commonly found associated with it . . . In interpreting these observations one feels justified in formulating the opinion that influenza is a distinct disease, recognizable clinically only by its epidemic proportions and extreme infectiousness, characterized pathologically by peculiar lesions in the lung, and caused by an unknown virus* which gained entrance through the respiratory tract."

Goodpasture's hypothesis was finally confirmed in 1933 with the isolation in ferrets of a virus from patients with influenza, and in 1934 the disease was produced in human volunteers with the virus, now called influenza Type A. The swine influenza virus, which had been discovered by Shope in 1931, was shown to be antigenically related to but not identical with influenza Type A. It was further shown that antigenic differences occur among Type A strains, differences which have great practical significance for immunization and patient resistance. In 1940 the Type B influenza virus was identified and in 1949 the less common Type C. Although most epidemics have been produced by various strains of the Type A virus, retrospective serologic studies indicate that the 1918-19 pandemic was caused by the swine influenza virus.

Facility of virus culture and serologic identification has made it possible to identify with accuracy the etiologic agent involved in epidemics and pandemics, and epidemiologic observations over the nearly 50 years since this became possible have indicated that although minor strain variations occur almost yearly, there are also periodic major changes in the virus. Because this produces a virus with which the population, or perhaps the younger members of it, has had no experience, there is almost invariably a rapid

* The term "virus" is an ancient one, which arose concurrently with the concept of transmissibility of disease. It was used as a general term in much the same way in which the term "germ" was used to refer to any disease-producing agent.

The term "virus" as used in 1919 referred to sub-microscopic, filterable, disease-producing infectious agents. After the beginnings of bacteriology in 1878, identification of microorganisms moved very rapidly, and it soon became apparent that there were infectious diseases for which no organism could be identified. Filterability of the agents through a porcelain filter became the accepted criterion for the designation "virus," so that the organisms were frequently referred to as "filterable" viruses. Using this criterion, the first virus was discovered in 1892, and in 1919 such diseases as scarlet fever and typhus were also considered to be virus diseases. Influenza on the other hand, was not. It was considered a bacterial disease.

spread leading to a pandemic. Until the failure of a pandemic, or even a major epidemic, to occur following reintroduction of the swine influenza virus into the human population in 1976, this was thought to be an invariable principle, but because the nation tooled up for a major epidemic last year, which failed to come off, the manufacturers of biologicals have become understandably gun-shy. This has resulted in apathy toward the development of another major serologic shift which occurred this past winter, so that instead of being faced now with a vaccine for which we have no disease, we may well be faced next winter with a disease for which we have no vaccine. The possibility of another 1918 epidemic was forecast for 1976. We may indeed see one in 1978.

In all the talk of possible pandemics in 1976, references were invariably made to 1918. But large numbers of people died from influenza in the winters of 1936-37, 1943-44, 1957-58, 1962-63, and most recently, though in somewhat smaller numbers, 1968-69. What then is so striking about 1918-19? In the first place there was a tremendous difference in the total excess deaths per 100,000 people (Fig. 1),⁴ which was approximately five times as high as the next highest figure, and over 20 times as high as that for any year in modern times. Another important factor was the depletion of the world of its resources and manpower by four long years of war. But probably the most important factor was that as with all plagues and natural disasters, even though the world was accustomed to heavy loss of life through battle casualty, it was totally unprepared for the pandemic which struck down what was left of its most productive citizens.

On Sept. 21, 1918, Camp Grant, Illinois, had a 650-bed hospital. Two weeks later there were 4,000 patients in it. The mortality rate was about 30%. In Europe the excess mortality in some places ran as high as 6,000 per 100,000 population. Reminiscing on his experiences as a 14-year-old youth in Germany, an Oklahoma radiologist comments,⁵ "As progressively more people died throughout the winter the reality of death dawned on individuals as it struck arbitrarily young and old, men and women, rich and poor, rural and city dwellers. It seems strange that the enormous number of fatalities caused by the just concluded war apparently had made less of an impression on the community and on me than the immediacy of the fatal epidemic around us."

The pandemic is said to have started in Madrid

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in the spring of 1918, and it came to be known as the "Spanish disease," or "Spanish flu," a name which is undeserved inasmuch as the disease had appeared in numerous places elsewhere, considerably earlier. Some German generals blamed the failure of their last offensive in the spring and summer of 1918 on the loss of so many men to the flu. Spain received the honor apparently because of censorship in the Allied and German armies, whose leaders were unwilling to admit to the widespread incapacitation of their troops.

Although the exact origin of the illness is difficult to pinpoint, search through both military and civilian records in all countries involved indicated the first recorded cases occurred in Fort Riley, Kansas, on March 11, 1918,⁶ and it is not unlikely that the disease spread throughout the world from that point. The disease proceeded in three waves, the first in the spring of 1918, then the "killer" wave in the fall of 1918, and finally

a somewhat milder wave in the early months of 1919.

The disease, which was to become known as the "purple death," quickly spread panic across the country. It prompted the following poem by an anonymous Illinois doctor:⁷

?Flu?
If we but knew
The cause of flu
And whence it comes and what to do,
I think that you
And we folks, too
Would hardly get in such a stew.
Do you?

It quickly ceased being funny. Before the winter was out a half million Americans would be dead of it, and the cost in loss of productive lives would reach into the billions of dollars, not counting the untold social misery, sickness, and personal loss that accompanied it. Roughly 25 million clinical cases of influenza, amounting to one fourth of the population, would produce disruption and virtual cessation of community life in many areas throughout the United States.

EXCESS MORTALITY DURING EPIDEMIC PERIODS, UNITED STATES, 1911-1976⁴

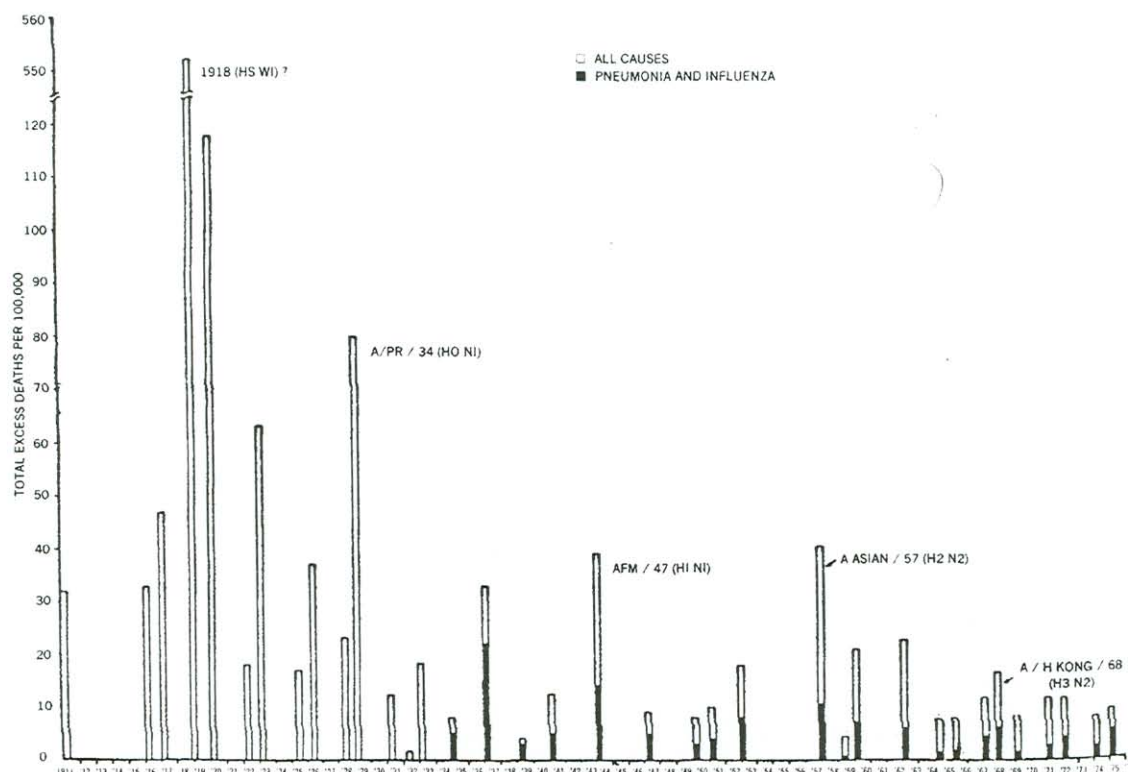


Figure 1

Entire families were stricken, often with no one to care for them, though there was a remarkably large number of dedicated volunteers. In the summer of 1918 American troops bound for the Western Front became a mere trickle, as flu caused 43,000 deaths in the U.S. Armed Forces in 1918, about 80% of the total number of American deaths in battle.

The Epidemic in Nashville

What of the disease in Nashville? Nashville at the time of the epidemic had an official population of approximately 120,000, but this was swollen by about 35,000 desperately crowded immigrants consequent to the location of a powder plant at Hadley's Bend, now Old Hickory, to approximately 155,000. There were approximately 40,000 cases of epidemic influenza from Oct. 1 to Nov. 15, of which 468 died, for a case fatality rate of 1.17%.¹ This means that in that six-week period about one person in four contracted the disease, and one person out of every 300 died of it, for a mortality rate of about 0.3%. By comparison, in 1873 Nashville had 27,000 inhabitants, 4,000 of whom became sick with cholera. One thousand of these died. Although the morbidity in the cholera epidemic was somewhat lower, about one in seven, the mortality rate was considerably higher, with a case fatality rate of about 25%, and a mortality rate of about 4%, which means one person out of every 27 died of cholera.

There are other differences also. In the cholera epidemic some areas of the city were virtually spared, while other areas, mostly those inhabited by the poor, were decimated, and in a few places nearly annihilated. Although the influenza epidemic showed definite patterns of spread, it showed no such selectivity. Perhaps it was not as bad as the cholera epidemic, but it was bad enough.

The disease made its appearance in the early days of September, reaching noticeable proportions by Sept. 16, and ten days later it had become apparent that epidemic status had been attained. We are hampered in our efforts to study the epidemic by the fact that all available statistics are based on estimates, as influenza was not previously, and in fact never became, a reportable disease locally, contrary to what it was in most other cities. In commenting on this, Dr. Derivaux said he believed reporting to be of questionable value in any case, because of lack of standards for diagnosis and the fact that

physicians in local practice were on almost constant duty day and night, with little time for filing reports. Numerical estimates then were based on verbal reports from physicians, collected by health workers and compiled by the health department. Nor do the compiled figures include the entire epidemic, but only the six-week period officially recognized as such. It appears there were cases all during the summer, and epidemic proportions were reached by Sept. 27. It was estimated that by the end of September there had been no less than 20,000 cases, raising the grand total to perhaps 60,000, with an indeterminate increase in the number of deaths.

Most of the reported cases occurred in the middle of October (Table 1), when 335 patients died, but for the three-month period October through December there were 579 deaths (Table 2). Forty-one percent of the dead were in the 20 to 39 year age group, and 60% were in the 15 to 49 year age group (Tables 3 and 4).

The epidemic began in South Nashville, a densely settled section in which many industrial workers, including many from the powder plant

TABLE 1
REPORTED DEATHS FROM INFLUENZA AT NASHVILLE,
OCTOBER, 1918

	White	Colored	Total
Oct. 1	5	0	5
Oct. 2	1	1	2
Oct. 3	6	0	6
Oct. 4	4	1	5
Oct. 5	5	0	5
Oct. 6	11	6	17
Oct. 7	17	3	20
Oct. 8	18	6	24
Oct. 9	19	5	24
Oct. 10	20	6	26
Oct. 11	19	10	29
Oct. 12	16	8	24
Oct. 13	18	9	27
Oct. 14	20	1	27
Oct. 15	17	2	19
Oct. 16	15	8	23
Oct. 17	14	11	25
Oct. 18	13	5	18
Oct. 19	10	4	14
Oct. 20	7	11	18
Oct. 21	9	0	9

TABLE 2
TOTAL DEATHS BY MONTH

Oct.	435
Nov.	61
Dec.	83
TOTAL	579

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in Old Hickory, lived. From there it spread to East Nashville and the center of the city, both of which also were densely populated by workers. As the disease waned in those areas, North and West Nashville, less densely populated but largely industrial, became the centers of highest incidence.

Nashville was ill-prepared to meet the challenge. The city of 155,000 people claimed 380 doctors, more than a third of whom were on active duty in the military service, leaving about 250 doctors to care for the quarter of the 155,000 people who would be sick with the flu, assuming all the doctors stayed well, which they did not. Almost every doctor in Nashville contracted the disease, and a number of them died, further depleting the thinned ranks. It quickly became apparent that organized relief measures had to be instituted very quickly, and the city public health nurses were given the sole duty of locating and classifying cases as to their severity.

On Sept. 30, Capt. Derivaux received telegraphic instructions to assume charge of the situation at the Old Hickory plant, and along with eight other public health assistant surgeons

TABLE 3
DEATHS BY AGE GROUPS
(468 DEATHS, OCT. 1-NOV. 15, 1918)

Age Group	No. of Deaths	% of Total
1 to 6 months	7	1.5
6 months to 1 year	15	3.2
1 to 2 years	42	9.0
3 to 4 years	32	6.8
5 to 9 years	36	7.7
10 to 14 years	20	4.3
15 to 19 years	40	8.6
20 to 29 years	110	23.5
30 to 39 years	83	17.7
40 to 49 years	46	9.8
50 to 59 years	14	3.0
60 years and up	23	4.9
TOTALS	468	100.00

TABLE 4
DEATH BY LIFE PERIODS

	Deaths	%
1 month, 9 years (infancy and childhood)	132	28.2
10 to 19 years (adolescence)	60	12.8
20 to 49 years (active adult life)	239	51.1
50 years and over (middle and old age)	39	7.9

he arrived the first week in October for duty in the Nashville area. They found a situation made acute by severe crowding of families, often in temporary and even uninhabitable buildings, incidental to the sudden 30% increase in population brought about by the location of the powder plant at Hadley's Bend. Moreover, there was a severe shortage of hospital beds.

A rapid increase in applications for admissions to the city hospital, far in excess of the capabilities of the institution, made necessary a quick decision about hospitalization of the sick. Establishment of emergency hospitals was ruled out by the severe shortage of both physicians and nurses, and also by Capt. Derivaux's opinion that emergency hospitals were of questionable value at best. The decision was therefore made to isolate the cases in their homes and to carry out their treatment there under the supervision of the public health nurses, who would periodically visit them. Physician consultation was left to the discretion of the nurse. Headquarters of this centrally organized house-to-house relief was in the office of the city health officer, where the public health nurses reported those cases deemed to be in need of physician care. Admission to the city hospital was granted only on certification by a physician. Two additional physicians and a number of nurses from the U.S. Public Health Service were added to the regular hospital staff. Transportation for the visiting physicians was supplied by the motor corps of the Nashville Red Cross chapter, who, along with the Nashville Golf and Country Club and the Centennial Club, gave material aid to the medical needs of the community.

By the second week in October, steps were introduced to limit contacts, though it was fairly well recognized that in such an epidemic there was probably no way to prevent exposure. The epidemic was now nationwide, all areas of the country being affected to one extent or another, particularly the military, where among the soldiers training in this country 12,975 cases had already been reported. Davidson County, as well as towns in adjoining counties, such as Springfield and Centerville, were even harder hit than Nashville. Some had no physicians at all, those who had not gone to war having been incapacitated by the flu.

On Oct. 7, Dr. Thomas Weaver became one of the earliest casualties among the medical profession, dying of pneumonia following a bout of the flu. On the following day, though the schools

still remained open, and though according to Dr. Hibbett there was no need for alarm, as new cases were not keeping step with the 15,000 cases which developed in the early days of the epidemic, an order went out banning all non-essential gatherings. The order, sent to proprietors of all amusements, which were considered nonessential, read, "You are hereby notified to close picture shows, theaters, carnivals, dance halls, billiard and pool parlors or other places of amusement until such a time as may be deemed suitable by the health officer in charge."

A decision was made on Oct. 8 to close the county schools for an indefinite period, as the physicians in the rural districts were not in a position to care for a general epidemic because their patients lived too far apart. On the other hand, following a conference between the superintendent of the city schools, the medical inspectors, and the city health officer, Dr. W. E. Hibbett, a decision was made that the situation in the city did not warrant closing its schools, as it was believed, wrongly as it turned out, that the crest of the epidemic wave had been reached. As a preventive measure, however, individual drinking cups were issued to the pupils, and every suspected case was to be sent home.

Although there was apparently a tendency on the part of some, including some doctors,⁸ to exaggerate the situation, we have the word of those who survived the epidemic and who are still with us that everyone was frightened. I have seen or heard no better description of the public mentality of the time than that written by a physician in Oliver Springs, Tenn., in an article entitled "Spanish Flu," which appeared in the *Journal of the Tennessee Medical Association* in December, 1918.⁹ It follows:

Spanish Flu

Give us another war with Germany, Mexico, and all the other heathenish countries in preference to another blast of this most distressing flu. The family of orphans, the lone widow, the cattle at the barn, with no one to feed; the plow standing in the field, rusting; the corn not gathered, and the general panorama of desolation viewed through tear-dimmed eyes; usher to our senses an observation that a great, merciless juggernaut has rolled over the land and left weeping and wailing in its path. Like a hideous monster, he went his way, and none could hinder. With a slight blink at the real old and the real young, he flung his javelin at the robust, middle-aged manhood and womanhood of the land, with a decided preference for the women in travail. The well-to-do were not exempt; while the ones in poor

circumstance and in uncomfortable dwellings possibly suffered most, it was not uncommon to see the white casket trimmed in velvet going into the cemetery along with the plain, cheap coffin of wood. A perilous time, and not quite over yet. The man who dug his neighbor's grave today might head the funeral procession next week. No telling who would be next.

In an effort at humor, the *Tennessean*, in the article reporting the closing of schools and places of amusements, said:

Pool Rooms Closed

Devotees of the ivories and the green cloth and the large number of frequenters who make billiard rooms their headquarters were very much grieved Monday when they showed up as usual and found the closed sign staring them in the face. The places where the wielders of the cues were wont to display their skill in executing apparently impossible shots and the equally dexterous youths who gave exhibitions of driving the ivories into the pockets presented morgue-like aspects, and former patrons were in moods to act as pallbearers at the obsequies. As a matter of fact the proprietors of those places were hard hit by the closing order. As a rule their places are located in the most desirable places in order to cater to the better element of patrons, and as a result rents, licenses, and other essentials are high. To remain closed for any length of time with present expenses continuing and nothing coming in means ruin for many of those who have not laid up a bank roll during the fat years.

That evening, Tuesday, Oct. 8, the *Nashville Banner* reported that the city schools had quietly closed their doors at noon "in order to prevent the spread of the now prevalent disease, Spanish influenza." This occurred, without a formal order from the health department, following a conference between the superintendent of schools, H. C. Weber, the health officer, Dr. W. E. Hibbett, and Capt. Derivaux. At the same time they requested ministers of the city to hold no more services in any of the churches until dangers of contracting the disease had abated, and ordered the officials of the Nashville Street Railway and Light Co. to run their cars with the windows open and to leave them open at night when they were taken to the barns, as "air, and air in abundance is one of the greatest preventives of the disease." It was thought these instructions and requests if followed would assist the department in handling the epidemic. No quarantine was ever issued, because the health authorities realized the danger of exposure was so great generally that to quarantine cases was next to impossible and of no value.

A quarantine was, however, imposed by fright.

Entire families were isolated by their neighbors, who refused to come to their aid even when no family member remained able to minister to the others. One physician reported having attended the father in a family of 11, the last to become ill, who when asked who would give the medicine, answered simply, "I don't know." Without the constant ministrations of the public health nurses and the fearless and dedicated volunteers from the Red Cross, the Centennial Club and the Nashville Golf and Country Club, the death toll would doubtless have been much greater. It is also undoubtedly true that the decision of Dr. Derivaux not to establish emergency hospitals, but to treat all but the pneumonia cases at home, saved a great many lives as it prevented exposure of many of the influenza patients to bacterial pneumonia.

As occasionally happens, the passage of time shows humor in situations which were dead serious. Dr. E. L. Bishop, physician in charge of rural sanitation for the state board of health, issued a statement concerning the manner in which influenza is transmitted and means to be taken to prevent its spread. After stating that the disease is spread by infected individuals through droplets from the nose or throat by "laughing, coughing, sneezing, loud talking, or any other act of forceable expiration," or by contact with articles contaminated by infected individuals, he went on to say, "promiscuous kissing and especially that of the 'nonessential' variety, is to be most forceably condemned. What right have you to impose the kiss of infection, which may truly be the kiss of death, upon a helpless unsuspecting infant, or indeed on any other person."

The powder plant, which was not uniformly popular in Nashville, was having its problems with propagandists, who had taken advantage of the death of a neighbor to start a rumor that the disease was not influenza at all but the black death, and that physicians were powerless to stop it. This rumor was having a bad effect on hiring labor and on Monday officers had been sent to East Nashville to arrest the propagandists. On Tuesday, Oct. 8, Dr. Olin West, secretary of the state board of health, and Dr. Derivaux, went to investigate the general health and sanitary conditions at the plant, and a newspaper account made the statement that "reports in circulation in the city, circulated by prominent persons, have been greatly exaggerated as to

influenza conditions at the plant, the number and severity of the cases, and the number of deaths. The physicians at the plant and the public health representatives rendered exceptional services, says Dr. West, and considering the large number of persons at the plant the disease has not been as widespread as in some other places."

In mid-August, flushing of the streets to remove filth had been discontinued by the board of city commissioners because of the scarcity of water owing to repairs in progress to one basin of the reservoir. With the accumulation of filth, and the concomitant rise in the number of cases of influenza, the repairs on the reservoir having been completed, the commissioners signed an order on Sept. 15 directing the resumption of the flushing. To save money, the department of sanitation had neglected this duty, and the *Nashville Tennessean* and the *Evening American* took it upon themselves to start a crusade to get the job done.

By Oct. 11, with the epidemic at its height, the streets were still not being flushed, and a large tabloid appeared in the center of the front page of the *Tennessean*, which stated:

Flush The Streets

An outraged public demands the flushing of the downtown streets and sewers—AND THEY DEMAND IT NOW.

Personal likes and dislikes, political moves to benefit political futures, must be cast aside. The cry today is for action.

God pity the man who, in the midst of a scourge, can't view things from other than a selfish standpoint.

The *Tennessean* calls upon the city commissioners to lay aside their differences—AND DO.

This is not the time to discuss negligence or failure to perform duty, be it right or wrong.

THE PUBLIC KNOWS THE STREETS OF NASHVILLE NEED FLUSHING, AND DEMAND THEY BE FLUSHED WITHOUT FURTHER QUIBBLING.

The *Tennessean* is in receipt of a long communication from one of the commissioners, explaining and elucidating, asking that it be published. The *Tennessean* does not think the people of Nashville care a whoop at this time for explanations—but the *Tennessean* does know THAT THE PEOPLE OF NASHVILLE WANT THE FILTH AND ACCUMULATED DIRT OF SIX WEEKS STANDING cleared from the streets—and, once again, calls upon the city commissioners to DO THEIR DUTY.

FLUSH THE STREETS, AND FLUSH THEM IMMEDIATELY.

Accompanying this tabloid was a story entitled: "Dirt, Disease, Danger." which stated:

Dirt, Disease, Danger

No one who has walked the streets of Nashville during the past few months has failed to note the filthy and unsanitary conditions in the city. There has been a general disposition to make all due allowance for the money, the scarcity of labor, the increasing population, and the need for economy in water, but in the present epidemic, it is impossible to ignore the filth. The danger point has been reached and the policy of toleration has reached its limitation.

The connection between dirt and disease is too firmly established in modern science for the filth of Nashville streets to be longer endured in the present state of the public health. There is no use to urge precaution and care upon the people and to continue to permit the filthy accumulation on the city streets. The sidewalks, gutters, and highways are littered with papers, fruit-peelings and trash and dirt of all kinds to the extent of indecency, disgrace, and peril to health. These streets must be cleansed and some effort must be made to maintain proper sanitary conditions in Nashville.

This epidemic will pass, but this does not mean that the city is safe from all danger of disease. Eternal vigilance is the price of municipal health in every growing city, and Nashville owes that much to her population, new and old. Greater Nashville needs greater care and attention. The city authorities must clean up.

The stories finally gained the desired results, though whether from the newspaper's reporting or the fear of the flu would be difficult to say. In any event, on Oct. 12 the *Tennessean* carried a story which said "The Nashville *Tennessean* and the *Evening American* won a great battle for Nashville. Steps taken Friday afternoon insure the flushing of the streets and the abolition of the filth which has been accumulating for ten weeks past on the city streets."

In spite of the many modern medical advances, the treatment of flu is pretty much unchanged 60 years later. Then as now, treatment for the flu itself was supportive, and the following story from the *Nashville Banner* for Oct. 10 is an interesting and humorous sidelight.

Dr. Hibbett A Very Popular Man

Being a vocalist is not usually rated as one of the essential acquirements of a physician; but if ever anybody was in position to feel occasion for singing that good old song, "They're After Me," it is Dr. W. E. Hibbett, city health officer of Nashville. They've been after him ever since Judge J. D. B. DeBow of the Criminal Court issued his famous order releasing for prescription use in fighting the influenza epidemic a portion of the captured liquor stored away in the police station.

The report that the fountain of health and felicity was being opened started a drive on the office of the city health department, such as would have stampeded a whole German army had it been directed toward Berlin. The strait and narrow doorway proved altogether too contracted to admit the stricken ones as fast as they came. Ignorant of the fact that Dr. Hibbett himself does not issue prescriptions, the multitudes groping in the darkness of despair thought they beheld a gleam of light, and they hurried to bask in its effulgence. Every forlorn creature who could fool the flu-germs scratching around in the dust of his throat hastened to the new beacon of light and liberty. Every lusty specimen who could tell of a sick wife or child at home joined in the headlong charge.

Dr. Hibbett, though something of an athlete, was helpless in the hands of his assailants. If he tried to answer the telephone some wretched victim of "the epidemic"—whatever it was—would drag him away in order to implore quick relief. If the health officer sought to hear a report or give instruction to one of his nurses some eager suppliant would be clutching at his other shoulder, and a third perhaps grasping his hands.

They literally thronged the office and overwhelmed the luckless physician. Business was halted—but there was no halt in the tramp, tramp, tramp of the boys marching up the steps to the office. And so, in order to save himself from being pulled to bits, and to permit those having proper business with the department to get an opportunity to transact it, Dr. Hibbett selected a muscular guard to stand at the foot of his stairs and challenge all comers. If they are on an errand properly requiring the attention of the health officer, they are admitted to Dr. Hibbett's quarters, but the suckers after the nearly extinct liquor are informed that only if they have a proper prescription from a certified physician will they be able to obtain it . . . [newspaper account illegible]

The epidemic reached its peak on Oct. 11, when 29 people died, though deaths remained in the double figures from Oct. 6-23 (Table 1). For statistical purposes the epidemic is considered to have lasted until Nov. 15, but by Oct. 15 the city health officer had reported the number of cases materially declining judging from the decrease in calls for aid from his department. In addition, private physicians had begun to offer their assistance, saying "their demand for services had decreased until they have some time to spare for emergency work. Most of the drug stores also report a diminution in the rush of prescription work which almost swamped them for some days past." By Nov. 1, the situation was such that schools and places of amusement were again opened, so that when the long World War ended some ten days later, Nashville was able to celebrate a double armistice.

INFLUENZA EPIDEMIC/Thomison

Nashville was apparently not much affected by the third wave of the epidemic in the early months of 1919, and there appears to have been only sporadic cases, with occasional deaths, unlike many areas of the country where the epidemic was severe. The optimism of mid-November appears to have been justified, largely due, as Derivaux points out in the conclusions of his paper, not to "measures to prevent spread," which he believed to be demonstrably futile, but to early detection of cases, with extension of relief to the ill, and the organization of the help service to produce systematic and rapid transportation. He also believed, apparently justifiably, hospitalization or congregation of cases in large numbers not to be in the best interest of the ill, and wherever possible they should be treated at home.

Conclusions

1. Considering available newspaper and medical records, "old-timers" appear to have an exaggerated idea of the severity of the epidemic, probably based on the fact that
 - a. one person in every 300 or so died, so that everyone knew one or more of the dead;
 - b. a considerable number of prominent citizens, including doctors, died;
 - c. one person in three or four was sick, and everyone was fearful of dying; and
 - d. coming as it did with the maximum war effort, the epidemic seemed too much to bear.
2. The possibility must be considered that for

reasons of wartime propaganda and morale, contemporary news and medical accounts may have played down the severity of the epidemic, so that in fact the truth of the epidemic's severity probably lies somewhere between that contained in the records and that remembered by the "old-timers."

3. The epidemic was indeed severe, but not compared to

a. some other epidemics (the 1873 cholera epidemic in Nashville and the 1878 yellow fever epidemic in Memphis);

b. the influenza epidemic in surrounding communities, where help was less well organized (much credit for the palliation of the epidemic in Nashville belongs to the Red Cross, the public health nurses, and the volunteers from the various civic organizations); and

c. the influenza epidemic in other cities, in some of which the mortality rate was more than twice what it was in Nashville (Table 5).

4. Medically speaking, we are only slightly better off in our relationship to influenza than the world was in 1918. Our advantage is in the possibility of treatment of complications and in the production of artificial immunity, though the organism continues to keep such programs off balance by frequent minor and occasional major immunologic shifts.

5. Now, as then, measures to prevent spread, such as quarantine, are essentially worthless, as infected individuals are asymptomatic carriers for several days prior to becoming clinically ill. The only way to avoid contact with influenza is to avoid all contact with all people.

6. It is fortunate for mankind that influenza is essentially a mild, self-limiting disease. □

TABLE 5

DEATHS AMONG ALL AGES IN A NUMBER OF TYPICAL CITIES

City	Population	Deaths Influenza, Pneumonia	Rate Per 1,000
Milwaukee	453,381	614	1.4
Indianapolis	289,577	427	1.5
Los Angeles	568,495	1,214	2.1
Louisville	242,707	610	2.5
New York	5,737,492	19,357	3.4
Providence	263,613	994	3.8
Boston	785,245	4,355	5.5
Baltimore	599,653	3,685	6.1
Philadelphia	1,761,371	12,665	7.2
Nashville	155,000	468	3.0

Taken from U. S. Census reports up to November 9, 1918.

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